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UNITED STATES DISTRICT COURT
DISTRICT OF OREGON
PORTLAND DIVISION

LEUPOLD & STEVENS, INC.,

Plaintiff / Counterclaim-Defendant,

v.

LIGHTFORCE USA, INC. d/b/a
NIGHTFORCE OPTICS and
NIGHTFORCE USA,

Defendant / Counterclaimant.

No. 3:16-cv-1570-HZ

**THIRD DECLARATION OF DAVID
BYRON IN SUPPORT OF
PLAINTIFF'S REPLY ON ITS
MOTION FOR PARTIAL SUPPLY
JUDGMENT**

I, David Byron, do hereby state and declare as follows:

1. I am a firearms expert with experience in small arms manufacturing and development, among other things, and have acted as an expert in cases involving firearms functioning and design, gunsmithing, ballistics, firearms value, history and identification. My curriculum vitae can be found at pages 256-266 of my Infringement Report dated August 10,

2018 (Dkt. 83-1). I am competent to testify and this declaration is based on my personal knowledge.

2. I understand that Nightforce has recently asserted that I lack relevant qualifications, including asserting that I lack relevant training, mechanical engineering design experience, adjustment knob and riflescope design experience, and experience regarding firearm-related locking component designs. Contrary to Nightforce's assertions, I have extensive experience and expertise in these areas. I have been in the firearms business for fifty years. I detail below additional relevant training and experience, in addition to that described in my CV, in these areas.

Relevant Education, Training, Certifications, and Teaching:

3. I was an undergraduate engineering student at the University of Florida for four years in the early 1970's, coming close to completing a bachelor's degree in engineering. After 4 years of classes, the economy was in a recession and it became clear that no jobs would be available in my chosen field upon graduation, so I withdrew from my college engineering program and went into business, putting my training and my personal interests into real world practice by opening a retail firearms and gunsmithing shop.

4. Although I chose not to complete an undergraduate engineering degree, I have continued my education by taking specific courses in engineering and science that I believed would provide me with valuable skills and help my career. I continue to do so to this day, and am currently taking classes through the University of Central Florida in engineering, criminalistics, and computer programming.

5. Since starting my own firearms and gunsmithing business in the 1970's, I have lived through the rapid technology changes that have left the traditional higher-education curriculum behind, including for example the switch from vacuum tubes to IC, the emergence of computers, and the materials revolution. I have managed to remain on the cutting edge of several

of these overlapping fields, including by pursuing classes, formal and informal training, and certifications, where applicable, in fields relevant to my work, including the following:

- Computer Assisted Engineering (CAE) – including training in ANSYS, NASTRAN, PATRAN and others. I have also honed and used these skills professionally as the CTO of Vintage Industries, and in my consultation for Lockheed Martin, Colt Firearms, Charter Arms, Winchester Repeating Arms, and others.
- Computer Assisted Design (CAD) – I have been trained in and regularly use 3D and 2D CAD, including Solidworks, Inventor, Autocad, Maya, Alias and others.
- Firearms Engineering – I have pursued training in the design of gun systems, ballistics, ammunition design. I have honed and used these skills professionally for over 45 years, including as the CTO of Vintage Industries, and in my consultation for Lockheed Martin, Colt Firearms, Charter Arms, Winchester Repeating Arms, and others. I also used these skills when I was the chief scientist on two military research projects involving firearm and weapons design and engineering.
- Computer Programming – I have been taking courses in programming since the 1970's. When I worked for Cosmi Corporation as the Director of Publishing Administration I supervised teams of programmers located around the world. I also was the sole programmer (author) of boxed retail computer programs.
- Computer Aided Manufacturing (CAM) – I have been trained in and use computer machining programs such as Mastercam and others. My experience as the CTO and owner of a company with a captive tool and die department has given me a real world background in machining and the equipment used in manufacturing operations. I have also taken courses in programming Programmable Logic Controllers (PLC) which enabled me to custom build

precision motion controlled machines used for the government projects and at my company.

6. While there are not formal licensing programs in “gunsmithing,” I have held federal licenses as a gun dealer, gun manufacture, and gun exporter.

7. I also have teaching experience relevant to my work and my expert opinions in this case, including serving as a college instructor in law enforcement gunsmithing and ballistics at Santa Fe Community College (now Santa Fe State College), in Gainesville, Florida, and at Seminole Community College (now Seminole State College), in Sanford, Florida. I am also approved by the Veterans Administration to conduct apprenticeship training programs to train military veterans as gunsmiths, and am a Florida State licensed firearms instructor, and a certified instructor in rifle, pistol, and shotgun marksmanship, and a police combat firearms instructor. In addition, I serve as a Technical Advisor to the Association of Firearm and Tool Mark Examiners.

8. I am a member of the Authors Guild, and have authored relevant publications in the field of firearms, as listed in my CV.

Mechanical Engineering Design Experience (Including Specific to the Fields of Firearms, Weapons, and Their Aiming Devices, Components, and Accessories):

9. I began work in the firearms field as an apprentice gunsmith while in college fifty years ago, and I still continue to work for my projects (currently advanced armor systems which includes materials engineering, mechanical engineering, design, testing and quality control) and consulting. I have designed machines for manufacturing, reverse engineered parts to provide lowered shutdown rates on high speed manufacturing equipment, and designed tooling for high precision manufacturing and varieties of materials.

10. As chief scientist for the U.S. Navy research project to create lightweight ammunition I designed and created a polymer cased ammunition. I have three issued U.S. patents for this ammunition: U.S. Patent Nos. 7,441,504 (entitled Base for a cartridge casing body for an

ammunition article, a cartridge casing body and an ammunition article having such base, wherein the base is made from plastic, ceramic, or a composite material); 6,845,716 (entitled Ammunition articles with plastic components and method of making ammunition with plastic components); and 6,752,084 (entitled Ammunition articles with plastic components and method of making ammunition articles with plastic components).

11. This project required intense CAE and a wide experience in firearms, ballistics and materials engineering, as well as manufacturing processes and mechanical engineering. The military nomenclature for my lightweight, polymer cased ammunition is .50 caliber MK 323 MOD 0 and it is shown below in linked belts (USMC photo):



12. As chief scientist for a U.S. Army research project to create lightweight ceramic machinegun barrels I needed expert experience in CAE and a wide experience in firearms, ballistics and materials engineering, as well as manufacturing processes and mechanical

engineering. I invented the Composite Reinforced Ceramic Barrel technology (CRCT), which provided an electrically non-conductive, static-free platform for firing projectiles. This was important to the development of “smart weapons.” In standard weapons with metal barrels firing programmable explosive projectiles static electricity generated mis-programming or even a round blowing up in the barrel. As part of this project I had to invent a new method of manufacturing thermoplastic composite tubular components to create a compressive stress of over 200,000 pounds per square inch on the ceramic barrel tube for an non-metal frettage.

13. In addition to the materials challenge, a method to bore and rifle (machine spiral grooves into) the very hard and tough ceramic needed to be invented. An end view of my CRCT gun barrel in the final manufacturing phase is shown below:



14. Shown below is the CRCT gun barrel being precision bored with diamond tooling that I designed.



15. As an experienced machine designer I set the state of the art by inventing a precision thermoplastic towpreg composite winder for a U.S. Army project. I designed and built the machine, and programmed the PLCs for the operation of the machine. The prototype is pictured below:



16. I am engaged with product design and related engineering tasks from the perspective of a consultant and expert witness. For example, in addition to this case, I have also served as an expert witness in fields including: firearms functioning and design; gunsmithing, ballistics, firearms value, history and identification; industrial systems, and software/programming. I am also under contract as an expert witness for the state of Florida's Justice Administrative Commission as an expert witness in firearms and ballistics for major criminal trials, such as homicide and other firearms related crimes.

Riflescope, Weapon Aiming Device, and

Related Adjustment and Mounting Device Design Experience:

17. I served as the police armorer and range officer for the Casselberry, Florida Police Dept. I have also served as a gunsmith for nearly all police departments throughout central Florida. In this role, I worked on the identification, selection, design, and repair of firearms and weapon systems for law enforcement agencies throughout central Florida, including selection, design, and assembly of sniper firearm systems, with a particular focus on high-performance riflescopes and related adjustment and mounting components for those sniper weapon systems.

Over my many years of experience as a gunsmith in this field, I have provided advice on, sold, mounted, sighted in and adjusted, and repaired thousands of riflescopes on and for civilian and law enforcement rifle and firearm systems.

18. My company, Byron's/Vintage Industries manufactured millions of OEM firearm and related parts for many manufacturers in the firearms business. Parts that I designed and manufactured through Vintage included tens of thousands of parts related to telescopic gun sights, including turret caps and telescopic sight mounts and Picatinny/Weaver rails for mounting riflescopes and related components. Through Vintage, I also designed and manufactured components for very high precision laser/optical bodies, and mounts and rails for military shoulder fired missiles. As the CTO of Vintage, I was responsible for the design, tooling, materials, manufacturing and quality control for these products.

19. This included design and fabrication of tooling and finished parts for very high precision laser/optical bodies, mounts and rails for military shoulder fired missiles. One one-piece design incorporated a precision tube for the laser, a Picatinny rail for the optics and a curved mounting surface to the missile launcher with an angular offset to the optics and laser. This item had some tolerances measured in microns. Working with Lockheed engineers, this project gave me an appreciation for the accuracy required in sighting systems, and the experience in translating these requirements to a fabricated final product.

20. Also specific to telescopic sights for projectile weapons systems (though significantly more complex than civilian rifle systems and riflescopes), I also worked with an optics manufacturer to integrate programming a "smart" projectile with data from a telescopic sight as the projectile left the barrel, so that the "smart" projectile could be set to detonate when it reached a specific x,y,z coordinate determined by the telescopic sight.

21. In addition, I also developed a solution that won an Air Force Open Innovation challenge to detect and locate incoming sniper fire within 0.1 seconds of being fired, locate the shooter within 10 yards, and automatically direct counterfire. The solution that I designed to win

this challenge also relates directly to optical projectile weapon sighting systems: it incorporated 360° 3D binocular machine vision in the infrared range, coupled with GPS, a geographic information system, and recognition and targeting algorithms. Below is a quote from a U.S. Airforce statement praising my sighting solution:

David was the winner of our open innovation challenge to develop a novel concept for detecting a sniper fire within .1 second of being fired and locate the shooter within 10 yards. David's solution was novel and much less expensive than the next best solution. His concepts are well formed and focused on practicality.

Bob Lee, Open Innovation project manager at the U.S.A.F. Wright Brothers Institute

22. I have also previously served as an expert witness in litigation involving riflescopes. In *Leapers, Inc. v. Chuanwen Shi, Trarms, Inc., D/B/A Presma, Inc.*, I was retained by the plaintiff to render opinions on the copying of riflescopes, mechanical attributes of riflescopes, and manufacturing of riflescope components.

23. In addition, as the Chief Technology Officer (CTO) of Vintage Industries, I was responsible for manufacturing and production with respect to products with extremely precise production tolerances, some with production tolerances measured in microns. I was responsible for overseeing production of these products, including devising and supervising means to assure that there were repeatable methods and apparatus to acquire and maintain required positioning in 3D space. This precision design and engineering experience is analogous to the mechanical positioning of optics within a telescopic sight.

Engineering and Design Experience Relating to Locking Components In the Field of Firearms, Weapons, and Related Aiming Devices, Components, and Accessories:

24. I have has worked as a gunsmith, inventor, consultant and author of firearms books. As a gunsmith I gained familiarity with about all of the locking systems used in firearms and their components, and used this knowledge to describe these systems in books I have written, including multiple editions of *The Firearms Price Guide* , *The Official Guide to*

Firearms Prices, and *The Official Guide to Handguns*, which describe the actions (locking systems) of the firearms listed.

25. As a consultant I have relied upon my familiarity with firearms, projectile weapons systems, riflescopes, and mechanical systems more generally to create or improve numerous firearm, weapon, aiming, and related systems incorporating locking parts. This ranges from placing parts to be machined in precision 3D X,Y,Z mountings so they could be transferred from one machining center to another without losing the precise location and orientation in 3D space to designing clamping systems.

26. I designed and created a precision locating and adjustment system for placing parts to be machined in holding fixtures that could be coupled to all of our 3 to 5 axis machining equipment. My system allowed each part to be placed in 3D space with a precise X,Y,Z position and orientation. Adjustments and zeroing could be achieved by computer motion control similar to a coordinate measuring machine (CMM) or by manual control using a digital read out (DRO) allowing the parts to be transferred from one machining center to another without losing their precise location and orientation in 3D space. This system was linked to 3D CAD and 3D CAM for machining and quality control, and to precise adjustment rotary handles (knobs) for manual adjustment. The manual adjustment control was to a repeatable accuracy of .0001 inches, and machine control was somewhat finer.

27. As an inventor I created new locking systems to lock firearm breeches, control hypersonic gas flow, hold bullets in a cartridge case to require a specific amount of “pull strength” to dislodge them, and ways to mechanically join dissimilar materials in a precision environment. For examples:

- In U.S. Patent 4,962,903 (Cooling method and apparatus for wings and other fuselage components) I invented a way to pressurize air utilizing a hypersonic gas flow with inlet and exhaust shut-offs requiring a locking ability.

- In U.S. Patent 4,947,730 (Firing mechanism for polymer weapon apparatus), I invented a firearm slidably-mounted locking block adjacent to the bolt to lock the bolt, a reset for the sear latching mechanism, and a camming surface for locking the sear latching mechanism.
- In U.S. Patent 4,926,739 (Polymer gun operating handle), I created an operating handle that unlocks the firearm's action.
- In U.S. Patent 4,703,826 (Polymer gun), I invented a new way to utilize the pressurized gasses of firing a cartridge to unlock the action, and for the firearm to use non-standardized gas pressures to achieve uniform action unlocking. It also teaches how to use camming surfaces to unlock the action.
- In U.S. Patent 5,438,895 (Fastener and driving tool), I invented a fastening system to lock parts together.
- In U.S. Patent s 7,441,504; 6,845,716; and 6,752,084, I invented a lock to hold bullet in place and a lock to latch the plastic caselet (polymer portion of the case) to the ceramic or metal base.

I declare under penalty of perjury of the laws of the United States that the foregoing is true and correct.

Executed this 9th day of November, 2018, at Lake Mary, Florida.


